

15 blood diastolic pressure parameter in mmHg, f =
 the heart rate parameter in s^{-1} , a = the radius
 parameter of arterial vessels in cm, T = the
 temperature parameter of blood plasma in $^{\circ}C$, α =
 the angle parameter of arterial vessels in cm and
 20 z = the axial length parameter of diffusional
 flux in cm,

an individual having the measured values of said
 atherosclerotic parameters of the following
 expressions:

25
$$J = A c^{\frac{11}{9}} (v^3 D^{16})^{\frac{1}{27}} \left(\frac{g \cos \alpha + fu}{z} \right)^{\frac{2}{9}} \quad (1.1)$$

or

$$J = B c^{\frac{11}{9}} p^{\frac{1}{3}} T^{\frac{16}{27}} a^{\frac{2}{3}} f^{\frac{2}{9}} z^{-\frac{2}{9}} \quad (1.2)$$

and

$$J = E c^{\frac{11}{9}} D^{\frac{16}{27}} z^{-\frac{2}{9}} (\cos \alpha)^{\frac{2}{9}} \quad (1.3)$$

30 wherein J = the mass transfer flux in $10^{-5} g/cm^2 s$,
 A , B and E = the variables that are independent
 of said atherosclerotic parameters, v and u = the
 variables related to said p and said a , D = the
 diffusion coefficient in cm^2/s , and g = the
 35 gravitational acceleration;

determining the normal values of said
 atherosclerotic parameters;

determining the disease risks yielded by the
differences between said measured values and said
normal values of said atherosclerotic
parameters;

adding all said disease risks together yields a
total risk of said disease;

determining a disease risk level containing said
total risk of said disease;

selecting an atherosclerotic risk factor related to
an atherosclerotic parameter that is the greatest
contribution to said total risk of said disease
so as to result in said risk factor as a primary
therapy target of said disease;

selecting a greater flux between the LDL mass
transfer flux and the monocyte mass transfer flux
so as to result in said greater flux as a primary
cause in said disease;

selecting a greater concentration level between the
LDL level in serum and the CRP level in blood
plasma so as to result in said greater level as a
secondary therapy target of said disease;

determining a relative ratio between current

60 said total risk and previous said total risk so
as to yield said relative ratio as a therapeutic
efficacy of said disease;

repeating above-mentioned said methods until said
disease risk level is reduced to a normal
65 level for said individual who requires the
therapy to prevent or to treat atherosclerosis-
related CHD or stroke; and

above-mentioned said methods are written as an
executable computer program named the MMA.exe
70 © 2004, by X.F. Wang to perform said methods.

2. A method as in claim 1 wherein determining
said disease risk yielded by the difference between
the measured value and the normal value of said LDL
concentration parameter, said method comprising the
75 steps of:

a measured value c_m in mg/dL of the individual's
LDL concentration in human serum is determined
using a medical technique for measuring the
concentration of blood constituents or said c_m
80 is determined by a physician;

a normal value c_n in mg/dL of said LDL
concentration is determined by the physician or

said $c_n = 100$ mg/dL for adult;

85 substituting said c_m and said c_n into the
following expression where $c_m \geq c_n$:

$$R_1 = \left(\frac{c_m}{c_n} \right)^{\frac{11}{9}} - 1 \quad (1)$$

and

calculating (1) yields said disease risk R_1 caused
by said LDL concentration parameter related to
90 the atherosclerotic risk factors being an
elevated LDL concentration in human blood,
hypercholesterolemia, high-fat diet, or other
risk factors that increase said LDL
concentration.

95 3. A method as in claim 1 wherein determining
said disease risk yielded by the difference between
the measured value and the normal value of said CRP
concentration parameters, said method comprising the
steps of:

100 a measured value c_m in mg/L of the individual's CRP
concentration in human blood plasma is determined
using a medical technique for measuring the
concentration of blood constituents or said c_m is
determined by a physician;

105 a normal value c_n in mg/L of said CRP concentration
and an equivalent factor F are determined by the
physician wherein $F = \left(\frac{D_c}{D_L}\right)^{\frac{16}{27}}$ and D_c = the CRP
diffusion coefficient and D_L = the LDL diffusion
coefficient or said $c_n = 1.0$ mg/L for adult and
110 said $F = 0.66$;

substituting said c_m , said c_n and said F into the
following expression where $c_m \geq c_n$:

$$R_3 = F \left(\left(\frac{c_m}{c_n} \right)^{\frac{11}{9}} - 1 \right) \quad (3)$$

and

115 calculating (3) yields said disease risk R_3
caused by said CRP concentration parameter
related to the atherosclerotic risk factors being
an elevated CRP level in human blood plasma,
systemic inflammation, infectious agents, or
120 other risk factors that increase said CRP level.

4. A method as in claim 1 determining said
disease risk yielded by the difference between
the measured value and the normal value of said blood
systolic pressure parameter, said method comprising
125 the steps of:

a measured value p_m in mmHg of the individual's blood systolic pressure is determined using a medical technique for measuring the human blood pressure or said p_m is determined by a physician;

130 a normal value p_n in mmHg of said systolic pressure is determined by the physician or said $p_n = 120$ mmHg for adult;

substituting said p_m and said p_n into the following expression where $p_m \geq p_n$:

135 $R_4 = \left(\frac{R_m}{R_n} \right)^{\frac{1}{3}} - 1$ (4)

and

calculating (4) yields said disease risk R_4 caused by said systolic pressure parameter related to the atherosclerotic risk factors being an

140 elevated level of blood systolic pressure, family history of hypertension, or other risk factors that increase said systolic pressure.

5. A method as in claim 1 wherein determining said disease risk yielded by the difference between the 145 measured value and the normal value of said blood diastolic pressure parameter, said method comprising the steps of:

a measured value p_m in mmHg of the individual's blood diastolic pressure is determined using
150 a medical technique for measuring the human blood pressure or said p_m is determined by a physician;

a normal value p_n in mmHg of the blood diastolic pressure is determined by the physician or said
155 $p_n = 70$ mmHg for adult;

substituting said p_m and said p_n into the following expression where $p_m \geq p_n$:

$$R_s = \left(\frac{R_m}{R_n} \right)^{\frac{1}{3}} - 1 \quad (5)$$

and

160 calculating (5) yields said disease risk R_s caused by said diastolic pressure parameter related to the atherosclerotic risk factors being an elevated level of blood diastolic pressure, family history of hypertension, or other risk
165 factors that increase said diastolic pressure.

6. A method as in claim 1 wherein determining said disease risk yielded by the difference between the measured value and the normal value of said heart rate parameter, said method comprising the steps of:

170 a measured value f_m in s^{-1} of the individual's heart rate is determined using a medical technique for measuring the human heart rate or said f_m is determined by a physician;

175 a normal value f_n in s^{-1} of said heart rate is determined by the physician or said $f_n = 72 s^{-1}$ for adult;

substituting said f_m and said f_n into the following expression where $f_m > f_n$:

$$R_6 = \left(\frac{f_m}{f_n} \right)^{\frac{2}{9}} - 1 \quad (6)$$

180 and

calculating (6) yields said disease risk R_6 caused by said heart rate parameter related to the atherosclerotic risk factors being an elevated level of heart rate, smoking cigarette, depression, or other risk factors that increase 185 said heart rate.

7. A method as in claim 1 wherein determining said disease risk yielded by the difference between the measured value and the normal value of said arterial 190 radius parameter, said method comprising the steps of:

determining a measured radius value a_m in cm of the individual's arterial vessel at the lesion-prone sites of arterial bifurcations, arterial branching, arterial curvatures or arterial tapering using a medical technique for measuring the sizes of arterial vessels or said a_m is determined by a physician;

195 a normal value a_n in cm of said arterial radius is determined by the physician or said $a_n =$ a value between 0.2 cm and 2.2 cm for adult;

200 substituting said a_m and said a_n into the following expression where $a_m \geq a_n$:

$$R_7 = \left(\frac{a_m}{a_n} \right)^{\frac{2}{3}} - 1 \quad (7)$$

205 and

calculating (7) yields said disease risk R_7 caused by said arterial radius parameter related to the atherosclerotic risk factors being an increased size of arterial radius at said lesion-prone sites, or other risk factors that increase the size of said arterial radius.

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8. A method as in claim 1 wherein determining said disease risk yielded by the difference between the measured value and the normal value of said plasma

215 temperature parameter, said method comprising the steps of:

220 a measured temperature value T_m in °C of the individual's plasma fluid in the region at said lesion-prone sites is determined using a medical technique for measuring the temperature of human blood plasma or said T_m is determined by a physician;

a normal value T_n in °C of said plasma temperature is determined by the physician or said $T_n = 37^\circ\text{C}$;

225 substituting said T_m and said T_n into the following expression where $T_m \geq T_n$:

$$R_8 = \left(\frac{T_m}{T_n} \right)^{\frac{16}{27}} - 1 \quad (8)$$

and

230 calculating (8) yields said disease risk R_8 caused by said plasma temperature parameter related to the atherosclerotic risk factors being an elevated temperature of said human blood plasma at said lesion-prone sites, elevated body temperature-related diseases, or other risk factors that increase said plasma temperature.

235 9. A method as in claim 1 wherein determining said

disease risk yielded by the difference between the measured value and the normal value of said angle parameter, said method comprising the step of:

240 determining a measured value α_m in degree of the angle between gravity and the average velocity of the blood fluid in the region at said lesion-prone sites using a medical technique for measuring the human arterial geometries or said α_m is determined by a physician;

245 a normal value α_n in degree of said angle is determined by the physician or said $\alpha_n =$ a value between the 10° and 60° for adult;

substituting said α_m and said α_n into the following expression where $\alpha_n \geq \alpha_m$:

$$250 \quad R_9 = \left(\frac{\cos \alpha_m}{\cos \alpha_n} \right)^{\frac{2}{9}} - 1 \quad (9)$$

and

255 calculating (9) yields said disease risk R_9 caused by said angle parameter related to the atherosclerotic risk factors being a reduced size of said angle, or other risk factors that reduce said angle size.

10. A method as in claim 1 wherein determining said disease risk yielded by the difference between the measured value and the normal value of said axial
260 length parameter of the diffusional flux, said method comprising the steps of:

determining a measured value z_m in cm of the individual's axial length of diffusional flux along the inner arterial wall at said lesion-prone sites using a medical technique for measuring the human arterial geometries or said z_m is determined by a physician;

270 a normal value z_n in cm of said axial length is determined by the physician or said $z_n =$ a value between 0.10 cm and 1.00 cm;

substituting said z_m and said z_n into the following expression where $z_m \leq z_n$:

$$R_{10} = \left(\frac{z_n}{z_m} \right)^{\frac{2}{9}} - 1 \quad (10)$$

and

275 calculating (10) yields said disease risk R_{10} caused by said axial length parameter related to the atherosclerotic risk factors being a decrease in said axial length of the diffusional flux, or other risk factors that decrease said

280 axial length.

11. A method as in claim 1 wherein adding said R_1 in claim 2 through said R_{10} in claim 10 together yields a total risk of said disease consisting;

285 a current total risk of said disease related to the currently measured values of said atherosclerotic parameters;

a previous total risk of said disease related to the previously measured values of said atherosclerotic parameters.

290 12. A method as in claim 1 wherein determining said disease risk level containing said total risk of said disease in claim 11, said method comprising the steps of:

295 dividing the disease risk level into the following seven risk sublevels: $0.84 \geq$ first disease risk level ≥ 0.00 , $1.75 \geq$ second disease risk level > 0.84 , $2.67 \geq$ third disease risk level > 1.75 , $3.67 \geq$ fourth disease risk level > 2.67 , $4.70 \geq$ fifth disease risk level > 3.67 , $5.76 \geq$ sixth disease risk level > 4.70 , and seventh disease risk level > 5.76 ; and

selecting a disease risk level containing said total risk of said disease in claim 11 from among seven of said disease risk sublevels.

305 13. A method as in claim 1 wherein selecting an atherosclerotic risk factor related to the atherosclerotic parameter that is the greatest contribution to said total risk of said disease in claim 11 so as to result in said risk factor as a
310 primary therapy target of said disease.

14. A method as in claim 1 wherein selecting said greater flux between said LDL mass transfer flux and said monocyte mass transfer flux so as to result in said greater flux as a primary cause in said
315 disease, said method comprising the steps of:

selecting said LDL mass transfer flux as a primary cause in said disease when said R_1 in claim 2 \geq said R_3 in claim 3;

320 selecting said monocyte mass transfer flux as a primary cause in said disease when said R_1 in claim 2 $<$ said R_3 in claim 3;

15. A method as in claim 1 wherein selecting said greater concentration level between said LDL level in human serum and said CPR level in human blood plasma

325 so as to result in said greater level as a secondary therapy target, said method comprising the steps of:

selecting said LDL level in serum as secondary therapy target of said disease when said R_1 in claim 2 \geq said R_3 in claim 3;

330 selecting said CRP level in blood plasma as a secondary therapy target of said disease when said R_1 in claim 2 $<$ said R_3 in claim 3;

16. A method as in claim 1 wherein determining said relative ratio between said current total risk of 335 said disease and said previous total risk of said disease in claim 11 so as to yield said relative ratio as a therapeutic efficacy of said disease.

17. A method as in claim 1 wherein repeating said 340 method in claims 2 through said method claim 16 until said disease risk level is reduced to a normal level for said individual who requires the therapy to prevent or to treat atherosclerosis-related CHD or stroke.

345 18. A method as in claim 1 wherein said method in

claim 2 through said method in claim 16 are written as an executable computer program named said MMA.exe to perform said methods which comprises:

inputting the currently measured values, the
350 previously measured values and the normal values of the individual's atherosclerosis parameters into the input screen of said MMA.exe; and

pressing the "update" button and the "calc. risk"
355 button of said input screen; and then

pressing the "evaluate" button so as to yield an output screen including a total risk of said disease, a primary cause in said disease, a primary therapy target of said disease, a secondary therapy target of said disease and a therapeutic efficiency for said individual who requires the diagnosis, the prevention or the treatment of atherosclerosis-related CHD or stroke.
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